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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/803,655	03/12/2001	Tatsuya Uchikawa	OSP-10234	6604

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EXAMINER

LEURIG, SHARLENE L

ART UNIT	PAPER NUMBER
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2879

DATE MAILED: 04/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/803,655

Applicant(s)

UCHIKAWA ET AL.

Examiner

Sharlene Leurig

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 February 2003.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) 5 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-11, 14-19, 22, 24, 25 and 27 is/are rejected.
- 7) ☒ Claim(s) 12, 13, 20, 21, 23 and 26 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 27 February 2003 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Drawings

1. The corrected or substitute drawings were received on February 27, 2003.

These drawings are accepted.

Response to Amendment

2. The Amendment filed on February 27, 2003 was entered and acknowledged by the Examiner. Claims 20-27 have been entered, and claims 1, 6, 8-11 and 19 as well as the specification have been amended.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1 and 2 stand rejected under 35 U.S.C. 102(b) as being anticipated by Barthelmes et al. (5,001,395) (of record). Barthelmes discloses a high pressure discharge lamp with a quartz glass bulb, a conductive element which is airtightly sealed at a sealing portion of the quartz glass bulb, and a pair of electrodes, each electrode of the pair being disposed in a quartz glass bulb so as to be opposite the other and each electrode being connected to the conductive element, wherein a part of each electrode is sealed at a sealing portion so as to generate a contacting portion formed by the part of the electrode and the quartz glass bulb (column 3, lines 3-20). The relationship

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between the electrode dimensions and the supplied power fits into the claimed equations. The table in column 3 shows a power rating of 35 W, an electrode contacting portion length of 1.7 mm, and an electrode diameter of 0.25 mm. The contacting portion length (1.7 mm) is less than $200/(P \times D)$ (which equals 22.6 mm) and greater than $0.8/(D^2 \times \pi)$ (which equals 1.59), which satisfies the claimed equations. The conductive element is molybdenum foils (column 3, line 12).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3, 4, 6-11, 15, 16, 19 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barthelmes et al. (5,001,395) (of record) in view of Honda et al. (6,249,086). Barthelmes discloses a high pressure discharge lamp with all the limitations discussed above but lacks an electrode surface roughness at the end portion of 5 μm or less. However, Barthelmes recognizes the need for a lamp with a long life (column 1, line 57). Honda teaches the polishing of the electrode contacting portion to reduce the blackening of the quartz glass bulb and thereby increase the premium life of the lamp. Honda teaches a lamp with an electrode with a maximum surface roughness of 5 μm or less (column 16, line 65). The surface roughness that Honda teaches falls within the claimed ranges of 3 μm or less, 1 μm or less, and 0.5 μm or less. Honda also

teaches the use of electrolytic polishing to yield an electrode with the desired surface roughness.

Regarding claim 4, Honda discloses a surface roughness at the contacting portion, but does not disclose the surface roughness to be between 2 and 3 μm . However, it would have been obvious to one of ordinary skill in the art at the time of the invention to make a contacting portion with a surface roughness of between 2 and 3 μm , since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding claim 8, Barthelmes discloses the relationship between the electrode contacting portion length and the supplied power, but does not disclose the length of the end portion to be between $P/150$ and $P/100$ mm, where P is the supplied power. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to make electrodes whose contacting portions were between $P/150$ and $P/100$ mm, where P is the supplied power, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding claim 25, the contacting portion defined by Barthelmes as extending from the end of the foil to the sealing portion of the bulb (column 3, lines 49-51) is formed by a part of each electrode of the pair of electrodes and the quartz glass bulb.

Therefore regarding claims 3, 4, 6-11, 19 and 25 it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Barthelmes'

electrode with one with a specified surface roughness via electrolytic polishing in order to increase the longevity of the lamp, as taught by Honda.

Barthelmes discloses a high pressure lamp comprising a fill of a noble gas, mercury and a mixture of metal halides (halogens) but is silent on the specific amounts of the fill components. Honda teaches a fill comprising 80 torr of an inert gas (column 17, line 45), which is within the claimed range of 6 kPa or more. Honda also teaches a halogen content within the range of 0.1×10^{-3} to 2×10^{-3} mol/cc, the lower end of which is equivalent to the claimed value of 10^{-2} $\mu\text{mol/mm}^3$. Therefore regarding claims 15 and 16 it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Barthelmes' lamp to have the specified inert gas vapor pressure and the halogen gas amount taught by Honda in order to have a long-lived lamp compatible with the electrode structure.

4. Claims 14, 17, 24 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barthelmes et al. (5,001,395) (of record) in view of Honda et al. (6,249,086) as applied to claims 3, 4, 6-11, 15, 16, 19 and 25 above, and further in view of Takeuti et al. (6,211,616). Barthelmes discloses a high pressure lamp with all the limitations discussed above, and Honda teaches a high pressure lamp with electrodes with a given surface roughness as discussed above. While Barthelmes teaches a fill of a noble gas, mercury and a mixture of metal halides (halogens), he is silent on the specific amounts of the fill components.

Takeuti teaches a mercury fill of 0.12 to 0.35 mg/mm³, which corresponds with the claimed amount, in order to have a long-lived lamp (column 3, line 1). Therefore

regarding claim 14 it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Barthelmes' high pressure lamp with electrodes with the surface roughness taught by Honda and further with a mercury fill of 0.12 to 0.3 mg/mm³ as taught by Takeuti in order to increase the lamp life.

Honda and Barthelmes lack a tungsten electrode comprising potassium oxide. It is well known in the art that halide lamps often encounter tube blackening.

Honda teaches a lamp with electrodes formed from "genuine tungsten or tungsten containing sub-components," but is silent on what the sub-components might be (column 5, line 42). Takeuti teaches the use of tungsten electrodes that contain potassium oxide, but no more than 12 ppm (column 3, line 10) in order to prevent tube blackening. The combination of the fill components and electrode content achieve a long-lived lamp (column 3, line 1).

Therefore regarding claims 17 and 27 it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the high pressure lamp of Barthelmes with an electrode surface roughness as taught by Honda and further with a potassium oxide containing tungsten electrodes as taught by Takeuti in order to increase the life of the lamp and prevent blackening of the tube.

Both Barthelmes and Honda disclose lamps with facing electrodes separated by a distance, but neither explicitly discloses the length of the distance.

Takeuti teaches that it is well known in the art to provide electrodes in halide lamps at a distance of 1.0 to 2.0 mm from each other (column 2, lines 23-24) and

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additionally teaches the spark gap distance of his own invention to be within the claimed range (column 4, line 65).

Therefore regarding claim 24, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Barthelmes' lamp with an electrode surface roughness as taught by Honda in order to increase the life of the lamp and prevent blackening of the tube and to modify it further with a spark gap distance as taught by Takeuti as Takeuti has taught it to be well known in the art.

5. Claim 18 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Barthelmes et al. (5,001,395) (of record) in view of Honda et al. (6,249,086) as applied to claims 3, 4, 6, 7-11, 15, 16, 19 and 25 above, and further in view of Genz (5,635,796). Barthelmes discloses a high pressure lamp with all the limitations discussed above, and Honda teaches a high pressure lamp with electrodes with a given surface roughness as discussed above. Neither Barthelmes nor Honda teach a lamp with a bulb wall load of 0.8 W/mm^2 or more. However, Barthelmes teaches the need for a lamp with an increased lifetime (column 1, line 57). Genz teaches the use of a high pressure lamp with a combination of characteristics that result in a longer lamp life, including a wall load between 40 and 85 W/cm^2 , which is equivalent to the claimed amount of 0.8 W/mm^2 or more. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the high pressure lamp of Barthelmes with an electrode surface roughness as taught by Honda and further with a wall load of 0.8 W/mm^2 or more as taught by Genz in order to increase the life of the lamp.

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6. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Barthelmes et al. (5,001,395) (of record) in view of Sugitani et al. (6,271,628). Barthelmes discloses a high pressure discharge lamp with a mercury fill and all the limitations discussed above, but lacks explicit disclosure of the internal pressure of the lamp.

Arcing is a well-known problem in the art.

Sugitani teaches the well-established method of increasing the pressure of a lamp in order to prevent arcing (column 1, lines 28-30) and specifically teaches an internal pressure of 110 atm (column 7, line 67), which is equal to 11MPa, which is within the claimed range of 8MPa or more.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Barthelmes' high pressure lamp to have an internal pressure of 8MPa or more in order to prevent arcing, as taught by Sugitani.

Allowable Subject Matter

7. Claims 12, 13, 20, 21, 23 and 26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 12 and 13 are found to be allowable because no prior art suggests or shows an electrode with a contacting portion having a surface roughness of 5 micrometers or less in one portion as well as another portion having a surface

roughness of between 5 to 12 μm , and more specifically, 7 to 9 μm . Honda discloses a surface roughness of less than 5 μm extending the length of the electrode.

Claims 20 and 26 are found to be allowable because no prior art suggests or shows an electrode with the limitations of claims 1 or 6 where the contacting portion is defined as extending from the sealing portion to the end of the electrode, where the end of the electrode is inside the foil beyond the edge of the foil. The contacting portion disclosed by Barthelmes extends from the sealing portion to the edge of the foil, and though the electrode extends into the foil, the contacting portion as defined in column 3, lines 49-51 terminates at the edge of the foil.

Claim 21 is found to be allowable because no prior art suggests or shows a lamp with the limitations of claim 1, where the power is between 120 to 200 W. Barthelmes discloses a power rating of 150W in the table in column 3, but the length of the electrode contacting portion does not fall within the claimed range at that power.

Claim 23 is found to be allowable because no prior art suggests or shows a lamp with the limitations of claim 1, where the diameter of each electrode is between 0.4 to 0.8 mm. Barthelmes discloses an electrode with a diameter of between 0.4 and 0.8 mm in the table in column 3, but the corresponding length of the electrode contacting portion does not fall within the claimed range.

Response to Arguments

8. Applicant's arguments filed on February 27, 2003 have been fully considered but they are not persuasive.

The applicant has argued that claims 1 and 2 are allowable over Barthelmes et al. (5,001,395) (of record) because Barthelmes fails to teach or suggest the features of the independent claim 1, including a contacting portion formed by the part of each electrode and the quartz glass bulb. The Examiner disagrees. The claimed limitation of a "contacting portion" formed by the electrode and the bulb is interpreted as being the portion of the electrode extending from the nexus of the electrode and the bulb to the area of the electrode contacting the foil. Barthelmes explicitly teaches such a contacting portion in column 3, lines 49-51.

While Barthelmes does not explicitly teach a maximum or minimum length of the contacting portion, Barthelmes does teach a contacting portion with a length that falls within the range of the claimed minimum and maximum. The independent claim is interpreted as claiming not only the maximum and minimum recited, but also any intervening values. Therefore Barthelmes teaches a contacting portion with a length having the claimed limitations.

The motivation of Barthelmes in teaching a lamp with the claimed limitations is irrelevant, since all that is required is disclosure of the lamp structure. Therefore claims 1 and 2 are not allowable over Barthelmes.

The applicant has argued that claims 3, 4, 6, 7-11, 15, 16 and 19 are allowable over Barthelmes et al. (5,001,395) (of record) in view of Honda et al. (6,249,086)

because the references "fail to teach, disclose or provide a reason or motivation for being combined" (page 10, lines 2 and 3 of the §103 Rejection section). The Examiner disagrees. Both Barthelmes and Honda disclose halide lamps having tungsten electrodes and quartz bulbs. Though Barthelmes does not explicitly disclose the common problem of the blackening of the arc tube in a halide lamp, he does disclose the appeal of good color rendition. Blackening of the arc tube, as discussed by Honda, would interfere with the good color rendition of the halide lamp. Honda provides a solution for the problem of blackening of the arc tube by providing electrodes with a certain surface roughness. Therefore it would have been obvious to combine the references to one of ordinary skill in the art at the time of the invention because blackening of the arc tube was a well-known problem in the art encompassing Barthelmes' lamp, and Honda provides a solution for the blackening of the tube, as was argued in the original rejection. Therefore the rejection is not one of hindsight reconstruction.

The applicant further argues that Barthelmes and Honda cannot be combined due to "structural differences" (page 12, line 2) such as the allegedly different fillings of the lamp and structure of the electrodes. The Examiner asserts that the alleged structural differences between the references do not exist. Both Barthelmes and Honda teach halide lamps (in Barthelmes the corrosive filling is the halide) with tungsten electrodes. The lack of a teaching by Barthelmes of electrodes with a surface roughness does not prevent its combination with Honda, due to the motivation discussed above.

The applicant further argues that Honda does not teach a distinct contacting portion with the claimed surface roughness, but instead teaches a "surface roughness . . . throughout the length of the electrode" (page 12, line 22). The claim language does not exclude the rest of the electrode from having a similar surface roughness as the contacting portion.

The applicant further argues that Honda teaches a different process of forming an electrode with the claimed surface roughness. The process of making is irrelevant as long as the structure is identical as claimed. Therefore Honda, in combination with Barthelmes, does teach or suggest each and every feature of the claimed invention.

The applicant has argued that claims 14 and 17 are allowable over Barthelmes et al. (5,001,395) (of record) in view of Honda et al. (6,249,086) and further in view of Takeuti et al. (6,211,616). The Examiner disagrees. The combination of Barthelmes and Honda teaches the claimed surface roughness of the electrodes, as discussed above. Takeuti is not required to disclose that claim limitation, and was used as a reference because of its teaching of the claimed amount of mercury vapor in the lamp and of the electrodes containing potassium oxide. Therefore claims 14 and 17 are not allowable.

The applicant has argued that claim 18 is allowable over Barthelmes et al. (5,001,395) (of record) in view of Honda et al. (6,249,086) and further in view of Genz (5,635,796). The Examiner disagrees. The combination of Barthelmes and Honda teaches the claimed surface roughness of the electrodes, as discussed above. Takeuti is not required to disclose that claim limitation, and was used as a reference because of

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its teaching of the claimed bulb wall loading pressure. Therefore claim 18 is not allowable.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sharlene Leurig whose telephone number is (703)305-4745. The examiner can normally be reached on Monday through Friday, 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on (703)305-4794. The fax phone numbers for the organization where this application or proceeding is assigned are (703)308-7382 for regular communications and (703)308-7382 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

Sharlene Leurig
April 17, 2003

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